

## **REMARKS**

The Applicants thank the Examiner for the examination to date and respectfully request reconsideration of the present application in view of the foregoing amendments and the reasons that follow.

### **I. Status of the Claims**

Claim 1 is amended to incorporate the recitation of claim 2; claim 2 is thus cancelled. The Applicants reserve the right to pursue the subject matter of any of the cancelled claims in a continuing application. No new matter is introduced, and claims 1, 3 and 5-6 are currently pending to be examined on their merits.

### **II. 35 U.S.C. § 103 Claim Rejection**

Claims 1-3 and 5-6 are rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over *Catalysts & Catalysis*, 2003, 45(2) 107-110 (“Wu”) in view of US 2005/0182264 (“Abekawa”). The Applicants respectfully traverse the rejection.

The Applicants respectfully submit that the Office has misconstrued Wu’s teachings and maintain that Wu teaches away from the present invention. At the outset, while not acquiescing to the grounds of the rejection, the Applicants hereby amend present claim 1 to recite that in the presently claimed method hydrogen peroxide is reacted with propylene in the presence of a titanosilicate catalyst having a specific X-ray diffraction pattern, wherein **the titanosilicate is a Ti-MWW precursor**. The Ti-MWW precursor, as explained in the April 12, 2010 Reply, is produced by acid treatment **without calcination**; thus, the precursor is **not crystallized**. See p. 5, line 25 to p. 6, line 5; p. 7, lines 11-18 of the present Specification.

The Applicants traverse the Office’s apparent position in the Advisory Action and the October 13, 2009 Office Action that the presently claimed Ti-MWW catalyst is a part of Wu’s invention. The Applicants maintain that Wu teaches away. Wu teaches that a calcined Ti-MWW (of Wu) is distinct from a non-calcined Ti-MWW precursor (as in the present invention)

based on the XRD data. Wu discloses two types of the titanosilicates: (1) one is prepared by acid treatment without calcination (Fig. 1(b)), which corresponds to the presently claimed Ti-MWW precursor; and (2) the other is prepared by calcination of the acid-treated titanosilicate at 823 °K (Fig. 1(c)), which corresponds to calcined Ti-MWW (Wu's invention). The XRD profiles of the Ti-MWW precursor and calcined Ti-MWW are respectively represented by Fig. 1 (b) and Fig. 1 (c). Thus, while Wu mentions an XRD profile of a non-calcined catalyst in Fig. 1(b), as referenced by the Office in the Advisory Action, Fig. 1(b) does not represent Wu's invention. Rather, Wu uses such a non-calcined catalyst only as a contrast to distinguish from Wu's own invention, which is a calcined catalyst. Thus, the Applicants reiterate that Wu teaches away.

Contrary to the Office's assertion, the presently claimed (non-calcined) Ti-MWW catalyst precursor and Wu's calcined catalysts have different XRD profiles. The Applicants direct the Office's attention in particular to the (002) peaks of each of Fig. 1(b)-(c) in Fig. 1 of Wu. As shown therein, the diffraction pattern of Fig. 1(b) (representing non-calcined catalyst) has a pronounced (002) peak, while that of Fig. 1(c) (representing Wu's calcined catalysts) does not have such a peak. The non-calcined Ti-MWW precursor (as presently claimed) has a (002) diffraction peak because it has a lamellar structure, whereas the calcined Ti-MWW has scarcely the (002) diffraction peak due to its three-dimensional crystal structure. *See* Wu, p. 6, lines 3-14. In fact, Wu explicitly teaches that Ti-MWW precursor has a different structure from calcined Ti-MWW.

Moreover, Wu teaches that the merely dried Ti-MWW (i.e., Ti-MWW precursor) showed lower activity on 1-hexane, as compared to Wu's calcined Ti-MWW. *See* Wu, p. 7, lines 1-7. The Applicants further respectfully traverse the Office's assertion that regarding the catalytic activity Wu teaches that the catalyst shows more excellent catalytic activity on liquid-phase epoxidation of linear alkenes than TS-1 and TS-Beta; the Office references p. 3, ¶ 2, of Wu. The reference by the Office in Wu is directed to calcined Ti-MWW having crystal structure, as described in p. 3, lines 9 to 12 of Wu, that "[w]ith respect to MWW Zeolite having a very unique crystal structure and ...". (emphasis added). Such a crystal structure is in stark contrast to the

presently claimed catalyst precursor, which does not have a crystal structure, as explained above. Thus, Wu does not teach or suggest the present invention, which is related to the epoxidation of linear alkenes using Ti-MWW precursor that does not have crystal structure.

The foregoing demonstrates that Wu teaches away by discouraging the use of the presently claimed non-calcined Ti-MWW catalysts precursor. Accordingly, in view of Wu's teachings, one of ordinary skill in the art would not have had a reason to use a Ti-MWW precursor for epoxidation of linear alkenes.

Abekawa does not remedy Wu's deficiencies. Specifically, Abekawa describes only a crystalline titanosilicate catalyst (i.e., calcined Ti-MWW). *See* Abekawa, ¶¶ [0009]-[0019]. Nowhere does Abekawa teach or suggest the presently claimed methods, which are related to epoxidation of propylene with the presently claimed Ti-MWW precursor. Thus, one of ordinary skill in the art would not have had a reason to combine Abekawa's teachings with those of Wu. Even assuming, *arguendo*, that these teachings were combined, the presently claimed invention would not have resulted.

Therefore, at least in view of the foregoing, the Applicants respectfully request that the rejection be withdrawn.

**CONCLUSION**

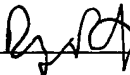
The Applicants believe that the present application is now in condition for allowance and thus respectfully request favorable reconsideration of the application.

The Office is invited to contact the undersigned by telephone if a telephone interview would advance the prosecution of the present application.

The Office is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, the Applicants hereby petition for such extension under 37 C.F.R. § 1.136 and authorize payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date June 14, 2010

By 

FOLEY & LARDNER LLP  
Customer Number: 22428  
Telephone: (202) 295-4620  
Facsimile: (202) 672-5399

Benjamin A. Berkowitz  
Attorney for the Applicants  
Registration No. 59,349